

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Previously Presented) A speech encoding method comprising:
adding a first signal from an adaptive codebook, which stores a past low-pass filtered excitation signal, and a second signal from a second codebook to generate an excitation signal;
generating a synthesized speech signal using the excitation signal;
filtering the excitation signal through a short-term excitation filter having low-pass characteristics to produce a low-pass filtered excitation signal; and
storing the low-pass filtered excitation signal in the adaptive codebook.
2. (Canceled)
3. (Previously Presented) A method according to claim 1, wherein the filtering step is performed by a recursive filter expressed by $R(z) = 1/(1 - k_1z^{-1})$ (k_1 : filter coefficient) in a z-transform domain.
4. (Canceled)

5. (Previously Presented) A speech encoding method comprising:
- selecting code information representing a first code vector by using an adaptive codebook so as to reduce perceptually weighted distortion between a target vector obtained from an input speech signal and a synthesized vector;
 - selecting code information representing a second code vector from a second codebook so as to reduce perceptually weighted distortion of a synthesized speech signal;
 - adding a first signal from the first code vector and a second signal from the second code vector to generate an excitation signal;
 - generating a synthesized speech signal using the excitation signal;
 - filtering the excitation signal through a short-term excitation filter having low-pass characteristics to produce a low-pass filtered excitation signal; and
 - storing the low-pass filtered excitation signal in the adaptive codebook.
6. (Previously Presented) A method according to claim 5, wherein the filtering step is performed by a recursive filter expressed by $R(z) = 1/(1 - k_1z^{-1})$ (k_1 : filter coefficient) in a z-transform domain.
7. (Canceled)

8. (Previously Presented) A speech decoding method comprising:
adding a first signal from an adaptive codebook, which stores a past low-pass filtered excitation signal, and a second signal from a second codebook to generate an excitation signal;
generating a synthesized speech signal using the excitation signal;
filtering the excitation signal through a short-term excitation filter having low-pass characteristics to produce a low-pass filtered excitation signal; and
storing the low-pass filtered excitation signal in the adaptive codebook.
9. (Canceled)
10. (Previously Presented) A method according to claim 8, wherein the filtering step is performed by a recursive filter expressed by $R(z) = 1/(1 - k_1 z^{-1})$ (k_1 : filter coefficient) in a z-transform domain.
11. (Canceled)
12. (Previously Presented) An electronic apparatus comprising:
a speech encoder configured to execute the speech encoding method according to claim 1; and
a speech input device configured to supply a speech signal to the speech encoder.

13. (Previously Presented) An electronic apparatus comprising:
a speech decoder configured to execute the speech decoding method according to claim 8; and
a speech output device configured to output a speech signal from the speech decoder.

14. (Previously Presented) An electronic device comprising:
a speech encoder configured to execute the speech encoding method according to claim 1;
a speech decoder configured to execute a speech decoding method comprising:
adding a first signal from an adaptive codebook, which stores a past low-pass filtered excitation signal, and a second signal from a second codebook to generate an excitation signal;
generating a synthesized speech signal using the excitation signal;
filtering the excitation signal through a short-term excitation filter having low-pass characteristics to produce a low-pass filtered excitation signal; and
storing the low-pass filtered excitation signal in the adaptive codebook.

15 - 17. (Canceled)

18. (Previously Presented) A speech encoding apparatus comprising:
an adaptive codebook configured to store a past low-pass filtered excitation signal;

a second codebook configured to generate a second signal;
an adder configured to add a first signal from the adaptive codebook and a second signal from the second codebook to generate an excitation signal;
a synthesis filter configured to generate a synthesized speech signal using the excitation signal; and
a short-term excitation filter having low-pass characteristics configured to filter the excitation signal and produce a low-pass filtered excitation signal to be stored in the adaptive codebook.

19. (Previously Presented) A speech encoding apparatus comprising:
a first codebook configured to store a past low-pass filtered excitation signal and generate a first code vector;
a second codebook configured to generate a second code vector;
a first code vector selector configured to select a code vector representing the first code vector from the first codebook so as to reduce perceptually weighted distortion between a target vector obtained from an input speech signal and a synthesized vector obtained from a candidate vector of the first code vector;
a second code vector selector configured to select a code vector representing the second code vector from the second codebook so as to reduce perceptually weighted distortion of a synthesized speech signal;
an adder configured to add a first signal from the selected first code vector and a second signal from the selected second code vectors to generate an excitation signal;

a synthesis filter configured to generate a synthesized speech signal using the excitation signal; and

a short-term excitation filter having low-pass characteristics configured to filter the excitation signal and produce a low-pass filtered excitation signal to be stored in the adaptive codebook.

20. (Previously Presented) A speech decoding apparatus comprising:
an adaptive codebook configured to store a past low-pass filtered excitation signal and configured to generate a first signal;
a second codebook configured to generate a second signal;
an adder configured to add the first signal and the second signal to generate an excitation signal;
a synthesis filter configured to generate a synthesized speech signal using the excitation signal; and
a short-term excitation filter having low-pass characteristics configured to filter the excitation signal and produce a low-pass filtered excitation signal to be stored in the adaptive codebook.

21. (Currently Amended) An electronic apparatus comprising:
a speech ~~encoder~~ encoding apparatus according to claim 18; and
a speech input device configured to supply a speech signal to the speech encoding apparatus.

22. (Currently Amended) An electronic apparatus comprising:
a speech ~~decoder~~ decoding apparatus according to claim 20; and
a speech output device configured to output a speech signal from the speech decoding apparatus.
23. (Previously Presented) An electronic device comprising:
a speech encoding apparatus according to claim 18;
a speech decoding apparatus comprising:
an adaptive codebook configured to store a past low-pass filtered excitation signal and configured to generate a first signal;
a second codebook configured to generate a second signal;
an adder configured to add the first signal and the second signal to generate an excitation signal;
a synthesis filter configured to generate a synthesized speech signal using the excitation signal;
a short-term excitation filter having low-pass characteristics configured to filter the excitation signal and produce a low-pass filtered excitation signal to be stored in the adaptive codebook;
a speech input device configured to supply a speech signal to the speech encoding apparatus; and
a speech output device configured to output a speech signal from the speech decoding apparatus.

24. (Canceled)

25. (Previously Presented) A method according to claim 1, wherein the second codebook is a stochastic codebook.

26 - 27. (Canceled)

28. (Previously Presented) A method according to claim 8, wherein the second codebook is a stochastic codebook.

29 - 30. (Canceled)

31. (Previously Presented) A speech encoding apparatus according to claim 18, wherein the first signal is an adaptive code vector multiplied by a gain; and the second codebook is a stochastic codebook.